

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of July 30, 2010 is respectfully requested.

By this Amendment, claims 73, 79, 87 and 88 have been amended. Thus, claims 73-88 are currently pending in the application. No new matter has been added by these amendments. In particular, it is noted that the amendments to claims 73 and 79 are supported at least by pages 12-13 of the original specification.

On pages 2-3 of the Office Action, the Examiner rejected claims 87 and 88 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner indicates that the phrase “the diameter of each cooling hole is a diameter extending in a direction parallel to the width of the air passageway slot” is unclear. Specifically, the Examiner notes the original specification discloses that the cooling holes are circular, and that circular cooling holes would have the same diameter regardless of the direction of measurement. However, the Examiner indicates that claims 87 and 88 may be interpreted as suggesting cooling holes which have non-circular shapes and/or multiple diameters.

In this regard, it is noted that claims 87 and 88 are directed to the relationship between the width direction of the air passageway slot as compared to the diameter of the cooling holes, as shown for example in Fig. 1A of the present application. In order to clarify this relationship, it is noted that the phrase “a diameter extending in a direction parallel to the width of the air passageway slot” has been deleted from claims 87 and 88, and that claims 87 and 88 have been amended to recite that “the width of the air passageway slot extends in a direction parallel to the diameter of each cooling hole,” as is shown in Fig. 1A. As the meaning of amended claims 87 and 88 is believed to be clear, it is respectfully submitted that the Examiner’s § 112 rejection is not applicable to amended claims 87 and 88.

On pages 4-11 of the Office Action, the Examiner rejected claims 73-84 and 87-88 under 35 U.S.C. § 103(a) as being unpatentable over Clingman et al. (US 5,130,163), as evidenced by “GE Silicones RTV 11” Data Sheet (hereinafter RTV 11 Sheet), and in view of Kang et al. (US 5,800,695) and the admitted state of the prior art, and optionally, further in view of Montierth (US 4,411,856). On pages 11-13 of the Office Action, the Examiner rejected claims 85-86 under 35 U.S.C. § 103(a) as being unpatentable over Clingman, as evidenced by RTV 11 Sheet, in view of Kang and the admitted state of the prior art, and optionally Montierth, and further in

view of Emer (US 6,380,512). For the reasons discussed below, it is respectfully submitted that the amended claims are clearly patentable over the prior art of record.

Amended independent claim 73 recites a method of forming a thermal barrier coating on a surface of a component having cooling holes. The method of claim 73 includes forming masking pins in the cooling holes by injecting a liquid elastic body into each of the cooling holes, and by thereafter hardening the liquid elastic body in the cooling holes, wherein the hardening of the liquid elastic body includes volumetric shrinkage of the liquid elastic body. The method of claim 73 also includes forming the thermal barrier coating on the surface of the component by spray coating after the forming of the masking pins. Further, claim 73 recites that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins *after hardening and shrinking by about 10%* do not protrude above the surface of the component.

Amended independent claim 79 recites a method of forming a thermal barrier coating on a surface of a component having cooling holes. The method of claim 79 includes forming masking pins in the cooling holes by injecting a liquid elastic body into each of the cooling holes, and by thereafter hardening the liquid elastic body in the cooling holes, wherein the hardening of the liquid elastic body includes volumetric shrinkage of the liquid elastic body. The method of claim 79 also includes blasting the surface of the component so as to coarsen the surface of the component, and forming the thermal barrier coating on the surface of the component by spray coating after the forming of the masking pins and the blasting of the surface of the component. Further, claim 79 recites that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins *after hardening and shrinking by about 10%* do not protrude above the surface of the component.

Clingman discloses a coating method which, as shown in Figs. 2-4, includes maskant plugs 30 being formed in side perforations 22 of an inside lamina 12. However, as noted by the Examiner on page 5 of the Office Action, Clingman does not disclose *injecting a liquid elastic body into each of the cooling holes, and that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes*

above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening and shrinking by about 10% do not protrude above the surface of the component, as required by independent claims 73 and 79.

In this regard, on page 5 of the Office Action, the Examiner notes that Clingman discloses the use of RTV-11 as a silicone rubber that is used to make the masking plugs 30. Further, the Examiner cites the RTV-11 Sheet as disclosing that one of ordinary skill in the art would recognize that the silicone rubber of Clingman is an easily pourable liquid having a shrinkage of 0.6%. The Examiner also acknowledges on page 5 of the Office Action that Clingman as modified by the RTV-11 Sheet does not disclose injecting a liquid elastic body into each of the cooling holes, and that *an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening do not protrude above the surface of the component, as required by independent claims 73 and 79.*

In this regard, the Examiner cites Kang as disclosing a maskant which is injected into cooling holes as a liquid and is then cured, and that the maskant is filled into the cooling holes so as to be flush with the surface of the component, and therefore concludes that it would have been obvious to one of ordinary skill in the art to modify Clingman by injecting the maskant in a liquid state into the cooling holes such that, taking into account any shrinkage of the maskant upon hardening, the cured maskant is flush with the surface of the component.

However, it is noted that Clingman, the RTV-11 Sheet and Kang do not disclose that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins *after hardening and shrinking by about 10% do not protrude above the surface of the component*, as required by independent claims 73 and 79. Rather, Clingman and Kang do not disclose a specific shrinkage amount of the maskant, and the RTV-11 Sheet only discloses a shrinkage of 0.6%, and therefore none of the Clingman reference, the Kan reference and the RTV-11 Sheet disclose that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening

and shrinking by about 10% do not protrude above the surface of the component, as required by independent claims 73 and 79.

Further, on pages 7-9 of the Office Action, the Examiner also optionally cites Montierth as disclosing that care should be taken to account for any shrinkage which occurs when forming a mask by injection molding, and cites the admitted state of the prior art as disclosing cooling holes which have a diameter larger than a width of an air passageway slot. However, it is noted that the Montierth reference and the admitted state of the prior art do not disclose that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening and shrinking by about 10% do not protrude above the surface of the component, as required by independent claims 73 and 79.

Accordingly, as none of the Clingman, RTV-11 Sheet, Kang and Montierth references and the admitted state of the prior art discloses that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins *after hardening and shrinking by about 10% do not protrude above the surface of the component*, as required by independent claims 73 and 79, it is respectfully submitted that the combination of the Clingman, RTV-11 Sheet, Kang and Montierth references and the admitted state of the prior art does not disclose or suggest all of the limitations of independent claims 73 and 79.

Therefore, for the reasons presented above, it is believed apparent that the present invention as recited in independent claims 73 and 79 is not disclosed or suggested by the Clingman reference, the RTV 11 Sheet, the Kang reference, the Montierth reference and the admitted state of the prior art taken either individually or in combination. Accordingly, a person having ordinary skill in the art would clearly not have modified the Clingman reference in view of the RTV 11 Sheet, the Kang reference, the Montierth reference and the admitted state of the prior art in such a manner as to result in or otherwise render obvious the present invention of independent claims 73 and 79.

Further, it is respectfully submitted that the Emer reference does not cure the defects of the Clingman, RTV-11 Sheet, Kang and Montierth references as discussed above.

Therefore, it is respectfully submitted that independent claims 73 and 79, as well as claims 74-78 and 80-88 which depend therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice to that effect is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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